

The Claims:

1-56 (cancelled)

57. (previously amended) A contact element for making an electrical contact to a contact member for enabling an electric current to flow between said contact element and said contact member, said contact element comprising:

a body having at least a contact surface thereof coated with a contact layer arranged to be applied against said contact member, which contact layer comprises a film comprising a multielement material, wherein said multielement material comprises material with equal composition as at least one of a carbide or nitride that is described as $M_{n+1}AX_n$ where M is a transition metal or a combination of a transition metals, n is 1, 2, 3 or higher, A is a group A element or a combination of a group A element, and X is Carbon, Nitrogen or both, said multielement material also comprises at least one nanocomposite comprising single elements, binary phases, ternary phases, quaternary phases or higher order phases based on atomic elements in the $M_{n+1}AX_n$ compound, wherein said nanocomposite comprises at least one of M-X and M-A-X nanocrystals and at least one amorphous region with M, A, X elements in one or several phases.

58. (previously presented) The contact element according to claim 57, wherein said nanocomposite comprises at least two of the following phases: M-A, A-X, M-A-X, X, M-X, or a combination of said materials.

59. (previously amended) The contact element according to claim 57, wherein the M, A, X elements of the amorphous regions are in at least one phase of M-A, A-X, M-A-X, or X.

60. (previously presented) The contact element according to claim 57, wherein said transition metal is Ti, n is 1, 2, 3 or higher, X is C, and A is at least one of Si, Ge or Sn or a combination of said elements.

61. (previously presented) The contact element according to claim 57, wherein said multielement material is Ti_3SiC_2 and the nanocomposite comprise at least one of the following Ti-C, Si-C, Ti-Si-C, Ti-Si, C or a combination of said materials.

62. (cancelled)

63. (previously amended) The contact element according to claim 57, wherein the amorphous region comprises at least one phase of M-A-X, AX, M-A, M-X, X, A, or M.

64. (cancelled)

65. (previously amended) The contact element according to claim 57, wherein said amorphous regions are mixed with said nanocrystals.

66. (previously presented) The contact element according to claim 57, wherein said film comprises individual regions that are single element, binary phases, ternary phases and/or higher

order phases of carbide and nitride.

67. (previously presented) The contact element according to claim 57, wherein said multielement material comprises individual regions that are a single element, binary phases, ternary phases and/or higher order phases with an average composition equal to or similar carbide and nitride.

68. (previously presented) The contact element according to claim 57, wherein said film comprises a nanocomposite having a composition comprising a combination of different $M_{n+1}AX_n$ phases.

69. (previously presented) The contact element according to claim 57, wherein the thickness of said film is in the range of a fraction of an atomic layer to 1000 μm .

70. (previously presented) The contact element according to claim 57, wherein the thickness of said film is in the range of 0.0001 μm to 1000 μm .

71. (previously presented) The contact element according to claim 57, wherein the thickness of said film is in the range of a fraction of an atomic layer to 5 μm .

72. (previously presented) The contact element according to claim 57, wherein said film comprises a metallic layer (Me), the thickness of the metallic layer is in the range of a fraction of an atomic layer to 1000 μm .

73. (previously presented) The contact element according to claim 72, wherein the thickness of the metallic layer in the range of a fraction of an atomic layer to 5 μm .

74. (previously presented) The contact element according to claim 72, wherein the thickness of the metallic layer in the range 1 nm to 1000 μm .

75. (previously presented) The contact element according to claim 72, wherein said metallic layer is any of Au, Ag, Pd, Pt, Rh or an alloy with at least one of any of the aforementioned metals.

76. (previously presented) The contact element according to claim 72, wherein said metallic layer is any metal or a metal alloy.

77. (previously presented) The contact element according to claim 72, wherein said metallic layer is any metal or metal composite where the composite can be an oxide, carbide, nitride or boride.

78. (previously presented) The contact element according to claim 72, wherein said metallic layer is any metal or metal composite, said composite comprising a polymer, an organic material or a ceramic material such as an oxide, carbide, nitride or boride.

79. (previously presented) The contact element according to claim 72, wherein said

multielement material layer is laminated with metallic layers in a multilayer structure.

80. (previously presented) The contact element according to claim 72, wherein said multielement material has a coat of said metallic layer, in that the contact surface is metallic.

81. (previously presented) The contact element according to claim 72, wherein the metallic layer covers grains or regions of the multielement material, with the total film thickness is in the range 0.0001 μm to 1000 μm .

82. (previously presented) The contact element according to claim 72, wherein the metallic layer is sufficiently thick to be able to wire-bond or solder a surface in a bonding to establish a non-separable electrical bond at the surface.

83. (previously presented) The contact element according to claim 57, wherein said film is continuous.

84. (previously presented) The contact element according to claim 69, wherein said film is discontinuous.

85. (previously presented) The contact element according to claim 57, wherein said film is deposited on said body and adheres thereto.

86. (previously presented) The contact element according to claim 57, wherein said film

is arranged as freestanding foil to be applied against said contact member when making said electric contact.

87. (previously presented) The contact element according to claim 57, wherein said film is doped by one or several compounds or elements for altering and improving friction, mechanical, thermal and electrical properties of said film.

88. (previously presented) The contact element according to claim 57, wherein said film comprises at least one single element M, A, X in the corresponding $M_{n+1}AX_n$ compound within a range of 0-50% by weight.

89. (previously presented) The contact element according to claim 85, wherein said film is formed on said body by means of a chemical method such as an electro less or an electrolytic process.

90. (previously presented) The contact element according to claim 85, wherein said film is deposited on said body by the use of a vapor deposition technique.

91. (previously amended) The contact element according to claim 90, wherein said film is deposited on said body by physical vapor Deposition or chemical vapor deposition.

92. (previously presented) The contact element according to claim 85, wherein said film is deposited on said body by dipping the body in a chemical solution or spraying it on said body.

93. (previously presented) The contact element according to claim 85, wherein said film is deposited using at least one technique selected from the following group

- arranged as freestanding foil to be applied against said contact member when making said electric contact;
- doped by one or several compounds or elements for altering and improving friction, mechanical, thermal and electrical properties of said film;
- formed on said body by means of a chemical method such as an electro less or an electrolytic process;
- deposited on said body by the use of a vapor deposition technique;
- deposited on said body by Physical Vapour Deposition or Chemical Vapour Deposition;

and

- deposited on said body by dipping the body in a chemical solution or spraying it on said body through for example thermal or plasma spraying.

94. (previously amended) A sliding electric contact arrangement, comprising:

- a contact element comprising a first contact surface;
- a contact member comprising a second contact surface, the contact element being coated with a film comprising a multielement material and arranged to form a dry contact with a friction coefficient, below 0.6 to the contact surface on the contact member, said multielement material comprising material with equal composition as at least one of a carbide or nitride that is described as $M_{n+1}AX_n$ where M is a transition metal or a combination of a transition metals, n is 1 , 2, 3 or higher, A is a group A element or a combination of a group A element, and X is

Carbon, Nitrogen or both, said multielement material also comprises at least one nanocomposite comprising single elements, binary phases, ternary phases, quaternary phases or higher order phases based on the atomic elements in the corresponding $M_{n+1}AX_n$ compound, wherein said nanocomposite comprises at least one of M-X and M-A-X nanocrystals and at least one amorphous region with M, A, X elements in one or several phases,

wherein the first contact surface and the second contact surface are adapted to be applied against each other for establishing an electric contact, the first contact surface and the second contact surface being operative to slide with respect to each other when establishing and/or interrupting and/or maintaining the contact action.

95. (previously presented) The contact arrangement according to claim 94, wherein said contact surface on the contact member is coated with a film comprising the multielement material.

96. (previously presented) The contact arrangement according to claim 94, wherein said surfaces of the contact element and the contact member are allowed to move with respect to each other as a consequence of magnetostriction or different coefficients of thermal expansion of the materials of surface portions of the contact element and the contact member upon temperature changes of the contact element and the contact member.

97. (previously presented) The contact arrangement according to claim 94, wherein the contact element and the contact member are adapted to be pressed towards each other for establishing said contact.

98. (previously presented) The contact arrangement according to claim 97, wherein the contact element and the contact member are adapted to be forced against each other by bolts or screws for establishing said electric contact there between.

99. (previously presented) The contact arrangement according to claim 94, wherein one of the contact element and the contact member is male-like and the other is female-like, and wherein the contact element and the contact member are adapted to establish said electric contact by being brought into engagement with each other.

100. (previously presented) The contact arrangement according to claim 94, further comprising:

means for spring-loading the contact element and the contact member against each other for making said electric contact

101. (previously presented) The contact arrangement according to claim 94, wherein one of the contact element and the contact member belong to two parts of a mechanical disconnecter movable away from each other for disconnecting two terminals thereof.

102. (previously presented) The contact arrangement according to claim 94, wherein one of the contact element and the contact member belong to two parts of a mechanical breaker movable away from each other for breaking the current path between the terminals thereof.

103. (previously presented) The contact arrangement according to claim 94, wherein one of the contact element and the contact member belong to a crimp contact.

104. (previously presented) The contact arrangement according to claim 94, wherein the contact element and the contact member are adapted to establish an electric contact in an electric rotating machine.

105. (previously presented) The contact arrangement according to claim 104, wherein the contact element and the contact member are adapted to establish an electric contact between two parts of the machine moving with respect to each other when the machine is in operation with the contact element and the contact member arranged on a separate such part.

106. (previously presented) The contact arrangement according to claim 104, wherein said moving part is a slip ring.

107. (previously presented) The contact arrangement according to claim 94, wherein the contact arrangement is adapted to establish an electric contact in a tap changer for a transformer for making a contact to different winding turns of the transformer.

108. (previously presented) The contact arrangement according to claim 94, wherein one of the contact element and the contact member belong to the parts movable with respect to each other in a relay for establishing an electric contact there between when the relay operates.

109. (previously amended) A method for creating a thin layer on a contact element member for making a good electric contact of said contact member to a contact member for connection to said contact member and having a low friction coefficient with respect to said contact member and contact element pressed together for forming said good electric contact, wherein the multielement material is coated with the metallic layer, wherein said multielement material comprises at least one nanocomposite comprising single elements, binary phases, ternary phases, quaternary phases or higher order phases based on atomic elements in a $M_{n+1}AX_n$ compound, wherein said nanocomposite comprises at least one of M-X and M-A-X nanocrystals and at least one amorphous region with M, A, X elements in one or several phases.

110. (previously amended) A method for creating a thin layer on a contact element for making a good electric contact of said contact element to a contact member for connection to said contact member and having a low friction coefficient with respect to said contact member and contact element pressed together for forming said good electric contact, wherein the multielement material is blended in the metallic layer, wherein said multielement material comprises at least one nanocomposite comprising single elements, binary phases, ternary phases, quaternary phases or higher order phases based on atomic elements in a $M_{n+1}AX_n$ compound, wherein said nanocomposite comprises at least one of M-X and M-A-X nanocrystals and at least one amorphous region with M, A, X elements in one or several phases.

111. (previously presented) Use of a contact arrangement according to 94, in which a contact for enabling contact to an electronic device, such as an integrated circuit, is covered with a said multielement material film enabling electrical contact to the device.

112. (previously presented) Use of a contact arrangement according to claim 94, in which a probe for measuring and testing an integrated circuit is covered with a said multielement material film avoiding chemical degradation and metal cladding on the probe.